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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/657,181

09/09/2003

Chun-lun Chiu

CHIU3030/EM

1619

2292 7590 01/30/2007  
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EXAMINER

LUU, AN T

ART UNIT

PAPER NUMBER

2816

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
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3 MONTHS

01/30/2007

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

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Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/30/2007.

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**Office Action Summary**

Application No.

10/657,181

Applicant(s)

CHIU ET AL.

Examiner

An T. Luu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11-3-06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,7,9-17,19-21 is/are rejected.
- 7) ☒ Claim(s) 2 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Amendment filed 2-28-06 has been received and entered in the case. Claims 1-7, 9-17 and 19-21 are pending. The rejections of claims, presented in the previous Office Action, are maintained.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 12, the limitation "the duty cycle converting circuit", line 1, lacks antecedent basis.

In claims 13-14, the limitation "the frequency-fixed PWM signal generating circuit", lines 1-2, lacks antecedent basis. And the limitation "the duty cycle converting circuit", line 5, claim 14, lacks antecedent basis.

Claims 15-17 are rejected for being dependent on the rejected claims as noted above.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by the Seong reference (U.S. Patent 5,606,296).

Seong discloses in figure 3 an apparatus comprising a duty cycle converting circuit 301 for receiving a first PWM signal  $V_o$  and then generating a duty cycle reference voltage  $V_{con}$  based on a first duty cycle of the first PWM signal, wherein the duty cycle reference voltage is a one-to-one mapping function of the first duty cycle ( $V_{con}$  is derived from  $V_o$  with respect to  $V_{oref}$ ), and a frequency fixed PWM signal generating circuit (the rest of the circuit), coupled to the duty cycle converting circuit, for receiving the duty cycle reference voltage and then outputting a second PWM signal (PWM output) having a fixed frequency, wherein the second PWM signal has a second duty cycle determined on the basis of the duty cycle reference voltage, and the second duty cycle is a one-to-one mapping function of the duty cycle reference voltage ("PWM output" is derived from  $V_{con}$  and  $V_{tr}$ ) as required by claim 1.

As to claim 4, Seong discloses the frequency fixed PWM signal generating circuit comprising a frequency controller (100 and 200) for providing a frequency control signal  $V_{tr}$  to determine the fixed frequency of the second PWM signal, and a PWM signal generator 302, coupled to the duty cycle converting circuit and the frequency controller, for generating the second PWM signal in response to the duty cycle reference voltage and the frequency control signal.

As to claim 7, Seong discloses (col. 2, line 64)  $V_{tr}$  being a continuous triangular wave signal.

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As to claim 9, Seong discloses in col. 1, lines 14-18, the operating frequencies being beyond tens of kilohertz. As to duty cycle range, Seong implicitly teaches all duty cycle range would be applicable to his circuit since Seong does not set a limit on duty cycle range. Further, the first duty cycle is well within the range of 5% to 95% since figure 4 discloses pulses within the above range (i.e., pulses generated by comparing a target signal with reference signal).

5. Claims 10, 13 are rejected under 35 U.S.C. 102(b) as being anticipated by the Jones et al reference (US Patent 5,952,798).

Jones discloses in figure 2 a control circuit 100 for speed of a fan motor 150, comprising a PWM signal generation unit 112 for generating a first PWM Vpwm signal having a first duty cycle; a PWM buffer circuit (138, 136), coupled to the PWM signal generation unit, for converting the first PWM signal into a second PWM signal (output of 136) having a fixed frequency and a second duty cycle (col.5, lines 7-17); and a driving circuit 142, coupled to the PWM buffer circuit, for outputting a driving signal COM based on the second PWM signal to the fan motor, thereby controlling the speed of the fan motor as required by claim 10.

As to claim 13, col. 1, lines 35-38, discloses the frequency-fixed PWM signal generating circuit is implemented by a microchip control unit set through software programs.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Seong reference (U.S. Patent 5,606,296).

Seong discloses in figure 3 all the claimed limitation including PWM signal generating circuit implemented by a microchip control unit (col. 4, lines 15-18). Seong does not disclose the microchip control unit is set through software program. However, it is common nowadays that software program is used for automation control. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate software program for either automation and/or selecting purpose. Further, a software program is not patentable.

As to claim 20, the scope of claim is similar to that of claim 3. Therefore, it is rejected for the same reason set forth above.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Seong reference (U.S. Patent 5,606,296) in view of the Hoffman reference (U.S. Patent 5,457,435).

Seong discloses all the claimed invention of claim 6 including a operational amplifier 302 having a non-inverting input terminal connected to the duty cycle converting circuit for receiving the duty cycle reference voltage and an inverting terminal connected to the frequency controller for receiving the frequency control signal as partially required by the claim. Seong does not disclose a resistor having a terminal connected to an output terminal of the operational amplifier such that the second PWM signal is output through another terminal of the resistor as required by claim.

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Hoffman discloses in figure 2 a PWM circuit comprising a operational amplifier 224 having an output coupled to a resistor 230 and the PWM signal is output through another terminal of the resistor as required by claim.

It would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Hoffman into that of Seong since a resistor is commonly used to drive a signal.

A skilled artisan in the art would have been motivated to combine the above prior art to shape the PWM signal to a desired level suitable for downstream device of the circuit as required by a particular application.

9. Claims 11, 14, 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Jones et al reference (US Patent 5,952,798) in view of the Seong reference (U.S. Patent 5,606,296).

Jones discloses all the claimed invention except for teaching the PWM buffer circuit comprising elements being configured as recited in claim 11.

Seong discloses such a PWM buffer circuit (See the rejection of claim 1 noted above). It would have been obvious to one skilled in the art at the time the invention was made to replace Jones' PWM buffer circuit with the one taught by Seong since a PWM buffer circuit can be implemented in many different ways. A skilled artisan would have selected Seong's PWM buffer circuit because it would provide a stable PWM signal.

As to claims 14, 17 and 19, as best understood in view of 35 USC 112 issues as noted above, see the rejections of claims 4, 17 and 19.

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As to claim 21, the scope of claim is the same as combination of claims 10, 11, 13 and 16. Therefore, it is rejected for the same reasons set forth above.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Jones et al reference (US Patent 5,952,798) in view of the Seong reference (U.S. Patent 5,606,296) and further in view of the Hoffman reference (U.S. Patent 5,457,435).

The scope of claim 16 is the same as the combination of claims 10 and 6. Therefore, the above reason for rejecting claim is also applicable herein.

#### ***Response to Arguments***

11. Applicant's arguments filed 11-3-06 have been fully considered but they are not persuasive.

Regarding claims 1, 4, 7, and 9, Applicant argued about fixed-frequency, Examiner respectfully disagrees since figures 4A-C confirm the fact that frequency of PWM signal is a fixed frequency. Further, Seong discloses *a pulse width modulating signal remains stable, col. 4, line 10-11* in which term "stable" is understood as unchanged-frequency, or fixed-frequency.

As to claims 3 and 20, they are rejected under 35 USC 103 in which Examiner indicated that *microchip control unit set through software* is obvious to one skilled in the art since computerization and/or automation is a norm nowadays.

As to claim 6, Examiner believes resistor 230 of Hoffman meets the requirement of claim.



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As to claims 10 and 11, new ground of rejection is presented to reflect Applicant's concern

***Allowable Subject Matter***

12. Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 12 and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to disclose an apparatus comprising elements being configured as recited in claim. Specifically, none of the prior art teaches or suggests, among other things, the claimed structures of "*the duty cycle converting circuit*" as recited in claims 2 and 12; the claimed structure of "*the frequency controller*" as required by claims 5 and 15.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to An T. Luu whose telephone number is 571-272-1746. The examiner can normally be reached on 7:30-5:00.

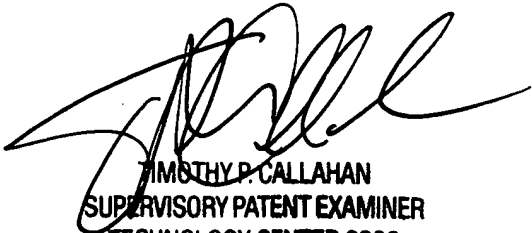
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy P. Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

An T. Luu

1-12-07 

  
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